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10/642,477	08/15/2003	Masakazu Kawai	20911-08172	3831

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EXAMINER

HOEKSTRA, JEFFREY GERBEN

ART UNIT	PAPER NUMBER
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3736

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/20/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/642,477	Applicant(s) KAWAI ET AL.	
	Examiner Jeffrey G. Hoekstra	Art Unit 3736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 9-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/20/2006 has been entered.

Notice of Amendment

2. In response to the amendment filed on 11/20/2006, amended claims 1, 4, and 8 is/are acknowledged. The following new and reiterated grounds of rejection are set forth:

Information Disclosure Statement

3. The information disclosure statement(s) (IDS) submitted on 09/06/2006 and 11/20/2006 is/are acknowledged. The submission is in compliance with the provisions of 37 CFR 1.97 and 1.98. Accordingly, the examiner is considering the information disclosure statement(s).

Claim Objections

4. Claim 2 and 3 are objected to because of the following informalities: there appears to be a typographical error and/or omission. The examiner notes claim 2 is interpreted to read "where *in* the step of determining which leg or legs are in contact with the ground...". Applicant's attention is requested.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-2, 4, and 6-8 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The *claimed* invention is directed to a judicial exception to 35 U.S.C. 101 (i.e., an abstract idea and abstract manipulations thereof). Moreover, the claimed invention is not directed to a practical application of such judicial exception because the claimed invention does not require any physical transformation and the invention as claimed does not produce a useful, concrete, and tangible result.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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8. Claims 1, 2, 4, and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al (IDS 09/06/2006, Cite No: C41). The examiner notes the only structural limitation requiring rejection is determining which leg or legs are in contact with the ground.

9. For claims 1 and 8, Park et al discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system (pages 3528-3533) as broadly as structurally claimed, comprising the steps of:

- determining which leg or legs are in contact with the ground;
- obtaining an attitude of the leg;
- obtaining the vertical component of acceleration of the center of gravity of the whole body including the leg and the attitude of the leg;
- obtaining the vertical component of an actual ground reaction force acting on the leg based on which leg or legs are in contact with the ground, the attitude of the leg and the vertical component of acceleration of the center of gravity of the whole body including the leg; obtaining an actual point of application of the ground reaction force based on which leg or legs are in contact with the ground, the attitude of the leg and the vertical component of acceleration of the center of gravity of the whole body including the leg and the attitude of the leg;
- obtaining moments acting around the joints of the leg, using the vertical component of the ground reaction force acting on the leg at the point of application of the ground reaction force, the vertical components of forces acting on the joints of the leg and a term of the acceleration of gravity and without using the horizontal components of

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the forces acting on the joints of the leg and a term of acceleration except the term of the acceleration of gravity; and

- obtaining the torques to be applied to the joints of the leg, based on the moments acting around the joints of the leg.

10. For claim 2, Park et al discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein the step of determining which leg or legs are in contact with the ground, the determination is made based on a value of the vertical component of acceleration measured on the body.

11. For claim 4, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein in the step of obtaining an actual point of application of the ground reaction force, the point is obtained based additionally on additionally on a location of the center of gravity of the body.

12. For claim 6, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein the vertical component of acceleration of the center of gravity of the whole body, is obtained based on locations of the centers of gravity of portions of the body, obtained based on attitudes of the leg and other portions of the body, and the vertical component of acceleration measured at the body.

13. For claim 7, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein in the step of obtaining moments acting around the joints of the leg, at first the vertical component of a force acting on and a moment acting around the knee joint of the shin, are obtained using the vertical component of the ground reaction force acting on the shin at the point of application of

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the ground reaction force and a term of acceleration of gravity and without using the horizontal component of the ground reaction force and a term of acceleration except the term of the acceleration of gravity and then the vertical component of a force acting on and a moment acting around the hip joint of the thigh, are obtained using the vertical component of a force acting on and a moment acting around the knee joint of the thigh and a term of the acceleration of gravity without using the horizontal component of the horizontal component of the force acting on the knee joint and a term of acceleration except the term of the acceleration of gravity.

14. Claims 1, 2, 4, and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Winter et al (IDS 09/06/2006, Cite No: C53). The examiner notes the only structural limitation requiring rejection is determining which leg or legs are in contact with the ground.

15. For claims 1 and 8, Park et al discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system (pages 75-102) as broadly as structurally claimed, comprising the steps of:

- determining which leg or legs are in contact with the ground;
- obtaining an attitude of the leg;
- obtaining the vertical component of acceleration of the center of gravity of the whole body including the leg and the attitude of the leg;
- obtaining the vertical component of an actual ground reaction force acting on the leg based on which leg or legs are in contact with the ground, the attitude of the leg and

the vertical component of acceleration of the center of gravity of the whole body including the leg; obtaining an actual point of application of the ground reaction force based on which leg or legs are in contact with the ground, the attitude of the leg and the vertical component of acceleration of the center of gravity of the whole body including the leg and the attitude of the leg;

- obtaining moments acting around the joints of the leg, using the vertical component of the ground reaction force acting on the leg at the point of application of the ground reaction force, the vertical components of forces acting on the joints of the leg and a term of the acceleration of gravity and without using the horizontal components of the forces acting on the joints of the leg and a term of acceleration except the term of the acceleration of gravity; and
- obtaining the torques to be applied to the joints of the leg, based on the moments acting around the joints of the leg.

16. For claim 2, Park et al discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein the step of determining which leg or legs are in contact with the ground, the determination is made based on a value of the vertical component of acceleration measured on the body.

17. For claim 4, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein in the step of obtaining an actual point of application of the ground reaction force, the point is obtained based additionally on additionally on a location of the center of gravity of the body.

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18. For claim 6, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein the vertical component of acceleration of the center of gravity of the whole body, is obtained based on locations of the centers of gravity of portions of the body, obtained based on attitudes of the leg and other portions of the body, and the vertical component of acceleration measured at the body. For claim 7, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein in the step of obtaining moments acting around the joints of the leg, at first the vertical component of a force acting on and a moment acting around the knee joint of the shin, are obtained using the vertical component of the ground reaction force acting on the shin at the point of application of the ground reaction force and a term of acceleration of gravity and without using the horizontal component of the ground reaction force and a term of acceleration except the term of the acceleration of gravity and then the vertical component of a force acting on and a moment acting around the hip joint of the thigh, are obtained using the vertical component of a force acting on and a moment acting around the knee joint of the thigh and a term of the acceleration of gravity without using the horizontal component of the horizontal component of the force acting on the knee joint and a term of acceleration except the term of the acceleration of gravity.

19. Claims 1, 2, 4, and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato et al (IDS 12/03/2003, Cite No: 1). The examiner notes the only structural

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limitation requiring rejection is determining which leg or legs are in contact with the ground.

20. For claims 1 and 8, Park et al discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system (pages 1-15) as broadly as structurally claimed, comprising the steps of:

- determining which leg or legs are in contact with the ground;
- obtaining an attitude of the leg;
- obtaining the vertical component of acceleration of the center of gravity of the whole body including the leg and the attitude of the leg;
- obtaining the vertical component of an actual ground reaction force acting on the leg based on which leg or legs are in contact with the ground, the attitude of the leg and the vertical component of acceleration of the center of gravity of the whole body including the leg; obtaining an actual point of application of the ground reaction force based on which leg or legs are in contact with the ground, the attitude of the leg and the vertical component of acceleration of the center of gravity of the whole body including the leg and the attitude of the leg;
- obtaining moments acting around the joints of the leg, using the vertical component of the ground reaction force acting on the leg at the point of application of the ground reaction force, the vertical components of forces acting on the joints of the leg and a term of the acceleration of gravity and without using the horizontal components of the forces acting on the joints of the leg and a term of acceleration except the term of the acceleration of gravity; and

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- obtaining the torques to be applied to the joints of the leg, based on the moments acting around the joints of the leg.

21. For claim 2, Park et al discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein the step of determining which leg or legs are in contact with the ground, the determination is made based on a value of the vertical component of acceleration measured on the body.

22. For claim 4, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein in the step of obtaining an actual point of application of the ground reaction force, the point is obtained based additionally on additionally on a location of the center of gravity of the body.

23. For claim 6, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein the vertical component of acceleration of the center of gravity of the whole body, is obtained based on locations of the centers of gravity of portions of the body, obtained based on attitudes of the leg and other portions of the body, and the vertical component of acceleration measured at the body. For claim 7, discloses a method for obtaining in real time torques to be applied to joints of a leg of a biped walking system, wherein in the step of obtaining moments acting around the joints of the leg, at first the vertical component of a force acting on and a moment acting around the knee joint of the shin, are obtained using the vertical component of the ground reaction force acting on the shin at the point of application of the ground reaction force and a term of acceleration of gravity and without using the horizontal component of the ground reaction force and a term of acceleration except the

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term of the acceleration of gravity and then the vertical component of a force acting on and a moment acting around the hip joint of the thigh, are obtained using the vertical component of a force acting on and a moment acting around the knee joint of the thigh and a term of the acceleration of gravity without using the horizontal component of the horizontal component of the force acting on the knee joint and a term of acceleration except the term of the acceleration of gravity.

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

25. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

26. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al in view of Tagami et al (US 5,808,433). Park et al discloses the claimed

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invention except for in the step of determining (a) which leg or legs are in contact with the ground and/or (b) a point of application of the ground reaction force, the determination and/or point of application is made using information from a sensor.

Tagami et al teaches using a sensor in a biped walking system (column 6 lines 12-24, column 10 lines 13-21, and column 14 lines 48-57). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method as taught by Park et al, with the sensor of Tagami et al for the purpose of increasing the efficacy of controlled movement in a biped walking system.

27. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winter et al in view of Tagami et al (US 5,808,433). Winter et al discloses the claimed invention except for in the step of determining (a) which leg or legs are in contact with the ground and/or (b) a point of application of the ground reaction force, the determination and/or point of application is made using information from a sensor.

Tagami et al teaches using a sensor in a biped walking system (column 6 lines 12-24, column 10 lines 13-21, and column 14 lines 48-57). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method as taught by Winter et al, with the sensor of Tagami et al for the purpose of increasing the efficacy of controlled movement in a biped walking system.

28. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al in view of Tagami et al (US 5,808,433). Kato et al discloses the claimed invention except for in the step of determining (a) which leg or legs are in contact with the ground and/or (b) a point of application of the ground reaction force, the

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determination and/or point of application is made using information from a sensor.

Tagami et al teaches using a sensor in a biped walking system (column 6 lines 12-24, column 10 lines 13-21, and column 14 lines 48-57). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method as taught by Kato et al, with the sensor of Tagami et al for the purpose of increasing the efficacy of controlled movement in a biped walking system.

Response to Arguments

29. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey G. Hoekstra whose telephone number is (571)272-7232. The examiner can normally be reached on Monday through Friday, 8:00 a.m. to 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max F. Hindenburg can be reached on (571)272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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